

REMARKS

Claims 16 and 29 have been amended. Basis for these amendments may be found in the specification, for example, at page 2, lines 1-4, and page 6, lines 2-4, respectively.

Claims 16-21, 24-26, 29, and 34 stand rejected under 35 USC §102 (a/e) as anticipated by the newly-cited Kabumoto et al (U.S. 5,723,510). This is a new ground of rejection. Kabumoto teaches a method of making thermoplastic polyester foam sheet for use as an insulating, wrapping, or packing material. The process includes rolling a polyester sheet with a separator such as a non-woven fabric, impregnating the polyester sheet with a gas, and heating the sheet to a temperature above the glass transition temperature to cause the sheet to foam. Optionally, an organic solvent such as acetone may be added to the “roll” prior to gas impregnation for raising the crystallinity of the sheet.

The Examiner asserted that Kabumoto’s process meets the rejected claims except that “Kabumoto does not explicitly teach the membrane as having an open pore foam.” The Examiner further asserted that the production of an “open pore” foam using Kabumoto’s process “should be inherent since the reference use [sic, uses] the same process as that of applicant.” Applicants disagree that Kabumoto teaches or uses the “same process” as claimed and further assert that the Examiner has failed to carry his heavy evidentiary burden of establishing inherency in Kabumoto.

In order to establish inherency, the evidence (as opposed to supposition or presumption) “must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by one of ordinary skill.” *Continental Can Co. USA v. Monsanto Co.*, 20 USPQ2d 1746 (Fed. Cir. 1991). The Federal Circuit has also cautioned that inherency “may not be established by probabilities or possibilities.” The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *In re Oelrich*, 212 USPQ 323 (CCPA 1981). As discussed in MPEP §2112, “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows

from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). Applicants submit that the Examiner has not carried that burden in this instance.

As taught at col. 1, lines 7 to 11, Kabumoto desires to manufacture a thermoplastic polyester foam sheet for use preferably as heat reserving material, heat insulating material, wrapping material, packing material and material for use in electronic parts. According to Kabumoto, such a thermoplastic polyester foam sheet is to be economically manufacturable in large quantities and is to have excellent mechanical strength, as well as a good surface appearance. It is known that for such uses a foam sheet does not need an open porous structure. Further, in order to obtain improved mechanical strength, one would desire that the structure of the polyester foam be a closed pore structure.

That Kabumoto desires to obtain, and does in fact obtain, a closed porous structure is confirmed by the reference to Martini-Vvedensky et al., U.S. Patent No. 4,473,665 (copy cited and attached by applicants to this paper). That patent describes a method of producing a *closed cell* foam which comprises impregnating an inert gas into a polymer sheet under pressure, reducing the applied pressure to create a supersaturated condition, heating the sheet at a temperature of a glass transition point or higher to permit the growth of cells, and then cooling the sheet to maintain the microcellular structure. Such a foam structure is called a "microcellular foam" and a "closed cell" foam by the patentee.

Kabumoto starts from the '665 patent teachings and applies those teachings to produce a thermoplastic polyester foam sheet with a microcellular closed cell structure to improve the mechanical strength of the products so produced. This is confirmed by the fact that Kabumoto refers to the cell structure as "containing fine cells" (see, e.g., col. 1, line 50 and col. 5, line 36) having cell sizes of "20 μ m or less" (see, e.g., col. 6, lines 15-16 and 66-67). Note that Kabumoto describes the closed cells produced by the '665 patent in exactly the same words, as "fine cells" (col. 1, line 36) which have sizes of from 2-25 μ m (see, '665 patent Abstract).

Thus, the intended use of the products made by Kabumoto on the one hand, and Kabumoto's intention to improve the mechanical characteristics of the "fine [closed] cell" foams

of the '665 patent on the other hand, establishes that Kabumoto's teachings are directed only to sheets of thermoplastic polyesters having a closed pore structure. In the face of direct evidence to the contrary in this record, the Examiner's speculation concerning the inherency of open cells in Kabumoto finds no support.

Nor is Kabumoto's process identical to that claimed by applicants. Kabumoto uses an organic solvent to impregnate the sheet of material before treatment with an inert gas. This impregnation of Kabumoto is taught to raise the crystallinity of the sheet, not to dissolve the sheet material as such (see, e.g., col. 4, lines 33-44). Applicants believe that all of the solvents mentioned in Kabumoto will not dissolve or swell the sheet materials mentioned by Kabumoto. Such solvents are mentioned in col. 4, lines 38-44, and the disclosed thermoplastic polyesters are described in col. 2, lines 9-14, as polyethylene terephthalate, polybutylene terephthalate, and copolymers thereof. Contrary to applicants' claimed method, the polyesters of Kabumoto as impregnated by an organic solvent are not believed to be dissolved in those solvents. Applicants believe that acetone is not a solvent for polyethylene terephthalate.

Applicants claim a process in which the "fluid" dissolves or swells the polymer or mix of polymers. This is believed to be a clear distinction between the claimed method and that taught by Kabumoto. Thus, practice of the claimed method and the method of Kabumoto result in different products, namely a closed cell structure in Kabumoto's process and an open porous structure in applicants' process. That these different processes produce different cell structures is further supported by the different uses of both products. Kabumoto intends only to use the resulting fine cell foam sheet materials as heat reserving materials, heat insulating materials, wrapping materials, packing materials and materials for use in electronic parts. The desired improvement of mechanical characteristics thereof are obtainable only with a closed cell structure.

Applicants' objective is to obtain an open pore membrane for separation purposes, like gas separation, ultra filtration, hemodialysis, blood filtration and so on. For such uses, closed pore structures are useless. Applicants submit that the rejection of claims 16-21, 24-26, 29, and 34 is not well taken and should be withdrawn.

Also in the Office Action, the Examiner rejected claim 22 under 35 USC §103 as unpatentable over Kabumoto. The Examiner concedes that Kabumoto does not teach or suggest a process in which a polymer is heated to above its glass transition temperature and then foamed by reducing pressure. Rather, the Examiner asserts that Kabumoto's concededly *different* process would be "equivalent" to the claimed process. In support, the Examiner cites to a number of reported cases involving issues of equivalency, *in an infringement context*. The Examiner's use of equivalency, taken in the context of infringement, is an inappropriate standard for determining obviousness. It has long been the law that equivalency is not the test for obviousness. *In re Flint*, 141 USPQ 299 (CCPA 1964) (the test of equivalency has no statutory basis, the proper test being obviousness as set out in §103); *In re Scott*, 139 USPQ 297 (CCPA 1963) (expedients which are functionally equivalent to each other are not necessarily obvious; statutory test is nonobviousness under §103). The conceded total lack of any teaching or suggestion in Kabumoto to modify the process disclosed therein demonstrates that the Examiner has not discharged his statutory burden. The rejection is not well taken and should be withdrawn.

Also in the Office Action, claims 16-27 and 29-34 were rejected under 35 U.S.C. §103(a) as being unpatentable over Klötzer et al (5,980,795) in view of Siggel et al (4,380,594). This is also a new ground of rejection. The Examiner asserted that Klötzer teaches a method of making an open pore membrane using a process in which a molten polymer charged with a gas under pressure is extruded. The pressure drop through the extruder causes expansion of the gas. The Examiner conceded that Klötzer does not teach or suggest a process in which from about 0.05 to about 4.5% by weight of a fluid that dissolves or swells the polymer is added to the polymer prior to foaming. The Examiner asserted that Siggel, which teaches a process for forming a *closed cell* foam, adds 1% by weight of a silicone oil to the polymer. The Examiner concluded that it "would be [sic, "have been"] obvious ... to use the teaching of Siggel in the teaching of Klötzer to improve the process (spinning speeds, etc.), to have more homogeneous pores, and to have at least partially hollow filaments, as taught by Siggel."

There are several deficiencies in the factual basis for the assertions, as well as in the ultimate conclusion of obviousness. Klötzer clearly desires a product that contains no solvents or other additives. See, e.g., col. 2, lines 35-42 and col. 5, lines 2-6, where Klötzer states that it is an advantage of Klötzer's process that there is no need for such additional substances which would then require removal "in an expensive manner." Klötzer criticizes prior art processes that use solvents at col. 1, lines 60-67, continuing onto col. 2, lines 1-3. Thus, contrary to the Examiner's assertion, one skilled in the art would not be motivated to modify Klotzer's process to do what Klötzer expressly teaches *not* to do. Further, Siggel does not teach a process for making a porous membrane, a porosity that Klötzer desires. Applicants submit that one skilled in the art would not modify the process of Klötzer in the manner proposed. The rejection fails because there is no suggestion or motivation provided by the art to combine the references' teachings.

Further, neither Siggel nor Klötzer teach a method of making an open pore polymeric membrane utilizing a polymer or polymer mix containing from about 0.5 to about 4.5% by weight of a fluid that dissolves or swells the polymer as recited in claim 16. As taught by applicants, the inclusion of such a fluid achieves the desired porosity in the final membrane. For example, see the specification at page 2, lines 6-20. The Examiner continues to assert that the silicone oil used by Siggel would function as a solvent and refers to Siggel at col. 7, lines 19-30. Applicants strongly disagree with the assertion that silicone oil would function as a swelling agent or solvent in this context and further disagree with the Examiner's characterization of the column 7 passage.

It is well known in the art that silicone oils generally do not dissolve or swell polymers, and especially the polymers disclosed in Siggel, i.e., polyethylene terephthalate and polyamides. Such polymers are resistant to silicone oils. The Examiner misplaces the burden of establishing obviousness. It is the Examiner's burden to establish by evidence that the claimed subject matter would have been obvious. In the absence of factual evidentiary support, applicants are not obligated to provide rebuttal evidence. Because the Examiner has cited no factual evidence to

support his speculation, no prima facie case of obviousness has been established. A rejection must be founded upon evidence, not speculation.

It is clear from Siggel that the use of silicone oil is intended to reduce abrasion as the polymer melt passes into the die of the filament forming unit. See col. 4, lines 53-37. The passage relied upon by the Examiner at column 7 provides no basis to conclude otherwise. Siggel states that it is the *gas* which is “dissolved or dispersed” in the polymer melt. The silicone oil is simply mixed with the gas and polymer melt. The reference in lines 25-26 of col. 7 to “components that are dissolved or mixed” in the polymer melt is to the gas, which is described immediately prior as being “dissolved” in the melt, and the silicone oil, which is described immediately prior as being “homogenized in mixer 5” with the melt, respectively. Accordingly, as Siggel does not teach or suggest an open pore membrane or a method which utilizes a fluid which dissolves or swells a polymer to form an open pore membrane.

As previously discussed, Klötzer also fails to teach or suggest the use of a fluid which dissolves or swells the polymer. Accordingly, even if one were to combine the teachings of Klötzer and Siggel, the claimed method would *not* result as neither Klötzer nor Siggel teach a method of forming an open pore membrane which utilizes a polymer containing a fluid that dissolves or swells the polymer as claimed. Claims 16-27 and 29-34 are clearly patentable over Siggel and Klötzer.

Claim 28 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Klötzer et al. in view of Siggel et al. and further in view of Malon et al. (US 5,013,767). As discussed above, there is no motivation to combine the teachings of Siggel and Klötzer, and even if combined, the references would still not teach or suggest the claimed invention. The Examiner has also failed to provide any motivation for combining the teachings of Siggel, Klötzer, and Malon. Klötzer expressly teaches *not* to use a solvent in its process, and, as discussed above, the silicone oil of Siggel is *not* a solvent or swelling agent. Rather, it is a process aid.

That Malon teaches a solvent for polysulfone provides no suggestion to use a solvent for polysulfone in the process of Klötzer because Klötzer does not want to use additives such as solvents and does not use polysulfone as the polymer. Further, the method taught in Malon relies

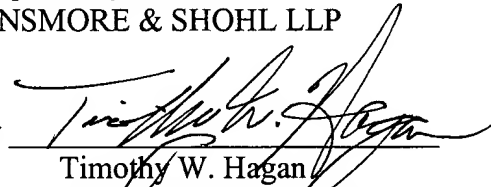
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on phase inversion of polymer solutions to form the membranes, not gas charging and foaming as taught in Siggel and Klötzer. The Examiner has provided no reasoning as to how or why one skilled in the art would or could combine these reference teachings.

Applicants respectfully submit that, in view of the above amendments and remarks, the application is now in condition for allowance. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
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